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Improving Provider Adherence to Guidelines in Addressing Childhood Overweight and Obesity in A Primary Care Setting

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IMPROVING PROVIDER ADHERENCE TO GUIDELINES IN ADDRESSING
CHILDHOOD OVERWEIGHT AND OBESITY IN A PRIMARY CARE SETTING

by

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APPROVED BY CAPSTONE COMMITTEE:

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“I can do all things through Christ who strengthens me.”

—(Phillippians 4:13, King James Version)

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Abstract

The purpose of the quality improvement project was to improve BMI measurement, screening, identification, documentation, and assessment of childhood overweight and obesity among children ages 3 to 18 years old in a primary care setting. Primary care providers continue to fail to address childhood overweight and obesity and have a positive impact on this issue. Delay in early identification and assessment of childhood obesity and overweight may affect patients' quality of life and the efficiency of health care. Over the last 30 years, the rates of childhood overweight and obesity have consistently escalated despite the existence of recommended guidelines and interventions developed by leading authorities. Retrospective chart reviews of 50 encounter notes conducted at pre and post intervention along with educational trainings utilizing components of two evidence-based tool kits that follow American Academy of Pediatrics recommendations, and supplemental resources such as BMI prompts on forms for provider, were implemented to seek improvement in the standard of care processes for overweight and obese children seen at a primary care clinic. The results indicated an improvement in the provider and staffs BMI measurements, screening, identification, documentation and assessment. There also was an improvement in provider documentation of BMIs, diagnosis, lab work, progress notes, recommendations and follow ups. Implementation of educational interventions utilizing tool kits and resources founded on evidence-based guidelines can lead to improvement in the primary care provider's achievement of delivering care for those overweight and obese children.

Keywords: childhood overweight, childhood obesity, quality improvement, body mass index measurement, evidence-based practice

Overview of the Problem

Childhood overweight and obesity continues to have an expansive presence in current society. According to the World Health Organization (WHO, 2016), over 40 million children across the globe were reported as being overweight or obese in 2013. The Centers for Disease Control and Prevention (CDC, 2015d) reported that every state in the nation has had a 20% or greater prevalence of obesity based on data from the latest Behavioral Risk Factor Surveillance System in 2014. The state of Texas currently ranks 11th in the nation with a 31.9% prevalence rate of obesity (CDC, 2015b). According to the Robert Wood Johnson Foundation (RWJF, 2014), rates of childhood obesity are said to be higher than former generations. Statistics illustrate that overweight and obesity are indeed far more than a nuisance, and are concerns that need to be seriously considered as these conditions will likely have costly and detrimental consequences.

Kolich (2012) explains that obesity increases one's chance of acquiring other unhealthy conditions, further increasing medical costs. Unhealthy conditions linked to obesity include diabetes, heart disease and strokes (CDC, 2015e). Children with overweight and obese conditions are also prone to be affected by social and emotional consequences. Consequently, obesity during childhood can lead to morbidity and mortality well into adulthood (WHO, 2016). Obesity is an issue that has already surmounted immense expenditures in healthcare systems nationwide, and has accumulated costs amounting to billions of dollars in the United States alone (CDC, 2015e). Health issues and escalated costs of healthcare may potentially continue to rise throughout the nation unless healthcare providers initiate early detection and prevention strategies targeting obesity (WHO, 2016).

The WHO (2016) reports that obesity is a chronic condition that has made a global impact with its escalated prevalence over the past few decades. Obesity has various etiologies that include genetic, environmental, as well as behavioral (RWJF, 2014). More significantly is this chronic condition's effect on many minority populations such as Hispanics. According to Ogden, Carroll, Kit, and Flegal (2014), Hispanic and Black children have higher rates of obesity compared to White children. This is an unfortunate situation, given the fact that obesity is a reversible condition (WHO, 2016). Overweight and obesity are health concerns that can affect individuals of all races and ages. It is vital that healthcare providers be knowledgeable, proficient, and utilize the latest resources to address these significant issues. It is through educational efforts and interventions that improvements can possibly be attained in managing and preventing childhood obesity (Huang et al., 2011).

Throughout the years, leading authorities such as the American Academy of Pediatrics (AAP), CDC, and the U.S. Preventative Services Task Force (USPSTF) have developed and emphasized evidence-based guidelines attempting to address the complex and evolving issues of childhood obesity (Barlow, 2007, & USPSTF, 2010). Organizations such as the United States Department of Health and Human Services (DHHS) and Healthy People (HP, 2014) have also developed national objectives that are evidence-based to guide providers in addressing childhood obesity. Successively, an expert committee spearheaded the search for widely used evidence-based interventions of childhood obesity as per the AAP's request to better equip providers with optimal resources for prevention and treatment (Barlow, 2007). Ultimately, guidelines and recommendations have included the use of BMI for universal screening, behavioral strategies, and lifestyle change modifications as standards of care in addressing childhood overweight and obesity (Barlow, 2007).

According to the WHO (2016), BMI is a simple and resourceful tool that can assist in screening and identifying overweight and obesity based on a person's height and weight measurements. The USPSTF (2016) recommends that primary care providers calculate BMI percentiles at every opportunity in order to assist in screening and identifying children who are at risk of having an unhealthy weight status. BMI is attained by calculating a person's weight in kilograms and dividing this number by a person's height in meters, squared (Buttaro, Trybulski, Bailey, & Sandber-Cook, 2013). In some primary care settings BMI can be taken manually or automatically calculated through the use of an electronic medical record (EMR) program. According to Apovian and Gordon (2014), the BMI is limited from identifying the total distribution of fat in the body but it is quite useful for screening and identifying individuals at high risk for overweight and obesity. Hence, BMI is a tool that can assist in identifying individuals at abnormal weight levels, as well as a guide for providers in taking appropriate measures and diagnoses of comorbidities or conditions associated with overweight and obesity.

Although BMI is calculated the same for both children and adults, it is interpreted differently. This is due to the fact that children are still growing and may attain excess weight during specific times in their growing years (CDC, 2015a). Therefore, the CDC has recommended that providers use BMI percentile growth charts for age and sex as a guide to screening, and following children's and adolescent's progress as they continue to age and grow (CDC, 2015a). The CDC refers to the population of childhood and adolescents as those who are 2 to 19 years of age. The terms overweight and obesity are used to identify individuals who are at abnormal weight levels based on a BMI measurement for age and sex. According to the CDC (2015a), among children and adolescents, overweight is defined as having a BMI for age and sex between the ranges of ≥ 85 th to ≤ 95 th percentile, and obesity is considered to be a BMI ≥ 95 th

percentile. Healthcare providers in primary care settings, to include physicians and nurse practitioners, hold key positions in delivering evidence-based care established by recommended guidelines.

Synopsis of a Microsystem

To gain a better perspective regarding the primary clinic for this intervention, a microsystem assessment was conducted during the fall of 2015. This clinic is situated on the southwest side of San Benito in southern Texas. According to Nelson et al. (2007), microsystems play a vital role in the success and outcomes of the larger macrosystems. The Clinic used for this project is owned and operated by a nurse practitioner, Dr. V., who is a DNP. Dr. V opened the clinic in 2012 and has been providing primary care services in the mesosystem of San Benito for populations ranging from birth to advanced ages (See Appendix A). Currently the clinic has 4,348 active patients' charts and the clinic continues to grow. The office is approximately eight miles east in proximity to two large hospitals that include Harlingen Medical Center and Valley Baptist Medical Center. The clinic serves the macrosystem of Cameron County, as well as other cities and outlying small towns that include Harlingen, Brownsville, La Feria, El Ranchito, Los Indios, Rio Hondo, and Combes. Although the clinic is small, it is quite busy as there was a census of 50-60 patients seen daily by the provider.

Dr. V. is a board certified nurse practitioner specializing in family practice, Anti-Aging and Regenerative Medicine, and focuses on hormone replacement therapy. The hours of operation at the clinic are from 8:00 am to 8:00 pm, Monday through Friday. The clinic is staffed with Dr. V. who is the sole healthcare provider for the clinic, one administrative secretary, a paramedic/lead medical assistant, one other medical assistant, and an office manager. The clinic also has a collaborative physician who is contracted as per guidelines of the Board of Nursing

under the Advance Practice Registered Nurse (APRN) rules. APRNs in the State of Texas must have a collaborative agreement in place for prescribing, treating, and diagnosis for patients. Most of the staff at the clinic are greatly experienced and have been working together for the last four years except for one medical assistant who has limited experience, and has only been working at the clinic for approximately eight months. The majority of patients seen at this clinic are comprised of Hispanic and White races and ethnicities (See Appendix B). The clinic accepts most insurances including Aetna, Blue Cross/Blue Shield, United HealthCare, Humana, Medicare, Medicaid, Children's Health Insurance Program (CHIP), and some workman's compensation insurances (See Appendix C). All visits have a reimbursement rate ranging from 80% to 100%, depending upon specific insurances, and Medicaid/Medicare rules.

The clinic provides care to patients with various illnesses, of which the top five diagnoses include hypertension, diabetes mellitus, hypothyroidism, generalized anxiety and hyperlipidemia (See Appendix D). The clinic schedules patient visits and also accepts walk-in patients' visits. Most patient schedules are usually, although not consistently, completed prior to the patient leaving the clinic. This includes lack of scheduling a patient to return for a follow up visit. All charting for patients is performed through utilization of an electronic medical record (EMR) system named eClinicalWorks. The provider has a lap top computer that he uses for charting which is situated in his office. All charting is done after the patient encounter, however at times when the clinic is very busy, the provider relies on notes that he writes on each patients super bill form, and transcribes at a later time in the day. The super bill is a form that has all of the patient information such as vital signs, height, weight, reason for the visit, as well as a list of visit codes, and lab tests that may be ordered for each patient encounter.

Through the utilization of a microsystem assessment tool, conducting patient, provider, and direct staff observations, staff confidential/voluntary interviews, and frequent communication with the healthcare provider, there were various strengths and weaknesses revealed in the clinic microsystem assessment. Data collected from voluntary interviews and assessment tools identified the strengths at the clinic, which included good teamwork and professionalism. Some of the identified deficiencies included poorly trained staff and a limited staff to meet high patient influx demands. In addition, the investigation identified that the clinic had a deficiency in the standards and processes of care in screening, identification, documentation and assessment for overweight and obese children.

Problem

Using the EMR system with the provider's presence and assistance, a four-month retrospective review covering a time period from July 2015 to October 2015 was performed. This review was conducted to search for any overweight and obesity criteria such as elevated BMIs and diagnostic codes of overweight and/or obesity in population ages 3 to 18 years old. The search revealed a total of 92 unidentified patient charts with BMIs meeting criteria of overweight and obesity for age and sex. A random sample of 30 unidentified patient charts demonstrated a BMI range of 25 to 46.7 (SD 4.79), and that more than half of the random sample had a mean average BMI of 31.7. Although these BMIs were not listed on the EMR as percentiles for age and sex, these figures were clearly abnormal.

The search of the random sample of patient records revealed no results for any diagnostic codes correlated to obesity which included V85.54 - body mass index > 85% to < 95%, V85.54- body mass index > 95% for age, 278.08- overweight, and 278.00 obesity, unspecified. A further search using the words 'abnormal weight gain' also did not reveal any results. An attempt to

search for BMI percentiles was also conducted in the EMR's main registry, since percentiles should be used when measuring BMI for children according to the CDC (2015a). However, there were no results. These aforementioned findings presented the possibility that the clinic was lacking in adequate documentation of BMIs in children who are overweight or obese, further suggesting the possibility of poor screening, identification and assessment processes.

At the clinic, BMIs, although automatically plotted by the EMR, were not being acknowledged and documented, and growth charts plotted by the EMR were not being updated. Furthermore, BMI was not being identified in percentiles for age and sex in children. Based on observation, the staff was inconsistent in their methods of performing weight measurements for every patient encounter.

Dr. V. acknowledged that the microsystem assessment findings of these abnormal weight issues were accurate and required improvement within the clinic. After the results were reviewed and discussed with Dr. V., and he supported the move towards improving the process of care in addressing these abnormal BMIs, inconsistent weight measurements, screening, identification, and lack of documentation, to ensure the best care for his patients. The specific problem for this project is the need for improvement in the standard of care processes for screening and identification, documentation, and assessment of childhood overweight and obesity to ensure that young children develop and maintain a healthy lifestyle today so that they may grow up to be healthy adults in the future.

Review of Literature/Evidence

PICOT

The question that spearheaded this project is: From June 1, 2016 to August 31, 2016, will delivering a provider and staff educational session regarding implementation of BMI measurement and guidelines improve screening and identification of overweight and obese children ages 3 to 18 years at the clinic? The PICOT question's information was utilized to search the literature for proven methods that have aided primary care providers in addressing childhood overweight and obesity following the recommended guidelines as per the AAP.

According to Kolich (2012), being obese increases one's chances of being vulnerable to developing other detrimental health issues. Some potential health conditions linked to abnormal weight conditions have included cardiovascular and endocrine disorders. Hasson et al. (2013) reported that there have been high rates of diabetes found in Latino children. Shaibi et al. (2012) reported that Latino youth who are obese carry added risks for cardiovascular disease and diabetes. In one study, Koebnick et al. (2013) revealed that obesity in male and female youths was linked to hypertension.

According to the CDC (2015c), obesity rates have continued to increase in all age groups. Approximately one-third of adults and 17% of children are noted to be obese (Ogden et al., 2014). Over the past 30 years, childhood overweight and obesity rates have constantly escalated despite recommended guidelines and interventions developed by leading authorities (Holub et al., 2014). The issue of overweight and obesity is one that should not be overlooked, especially in youth. It is crucial that interventions and education for improving these preventable conditions of overweight and obesity in youth be a priority to prevent future issues. Primary care settings

are areas that should be further evaluated to identify opportunities for early prevention, screening and assessment (Ogden et al., 2014).

According to Higgins, McCarville, Kurowski, McEwen, and Tanz (2014), early recognition and documentation of overweight and obesity in children is key to identifying other at-risk problems and guiding treatment. Findings at the primary care clinic revealed that clinic staff members lacked education in the standard of care processes for BMI measurements, screening, identification, documentation and assessment of childhood overweight or obesity. Furthermore, staff and provider were also lacking in their knowledge of evidence-based guidelines for addressing overweight and obesity in children. BMI measurements were not being conducted or documented. A great amount of research suggests that minority populations are very prone to having abnormal weight levels. According to Ramirez, Chalela, Gallion, Green, and Ottoson (2011), “Latino children have some of the highest obesity rates” (p. 251). Furthermore, Hispanic populations are considered the largest growing minority compared to any other race (Holub et al., 2014). In 2014 Texas’s population consisted of approximately 38.6% Hispanics/Latinos (U.S. Census Bureau, 2015). These findings are significant, given the fact that the majority of the patients seen at the clinic are Hispanic.

Childhood overweight and obesity are conditions that will continue to exist, thus must be identified at the earliest opportunity. Healthcare providers must step up to the challenge and engage in using recommended evidence-based guidelines that follow standards of care for treating childhood overweight and/or obesity issues.

Methodology/Search Strategy

A literature review was conducted to evaluate current research studies related to the useful interventions which incorporate tool kits and educational strategies to improve upon

primary care provider's identification, documentation, screening, assessment and management of childhood overweight and obesity. The databases utilized when searching for relevant literature included the Cumulative Index to Nursing and Allied Health Literature (CINAHL), Pub Med, and Medline. The purpose of the review was to identify evidence-based methods of applying clinical based guidelines and/or tools within a primary care setting to assist healthcare providers in identifying and addressing the significant issue of overweight and obesity in youth.

Identification of obesity at its early stages can prevent future health issues well into adulthood (CDC, 2014). As healthcare providers at the forefront in primary care settings, it would be valuable to have the necessary tools, up-to-date best approaches, education and capabilities to conquer this preventable condition.

Literature Review

Success in addressing childhood obesity in primary care settings is an arduous task that requires a strong knowledge base, skills, and careful planning. Higgins et al. (2014) reported the need to further examine the healthcare provider's struggles in gaining enhanced comprehension of screening, identification, and addressing obesity in children. Various studies have shown that healthcare providers are falling short in meeting or adhering to guidelines from leading authorities in using BMIs in screenings and assessments (Higgins et al., 2014, Huang et al., 2011, Jacobson & Gance-Cleveland, 2011, & Keehbauch et al., 2012). Some contributing factors of the lack of adherence to guidelines included limited time during patient encounters, poor reimbursements, inadequate resources or materials, and lack of follow-up by healthcare practitioners.

Primary care providers play a vital role in identifying, screening and managing obesity or overweight issues in children and adolescents. According to Jacobson and Gance-Cleveland

(2011), healthcare providers are lacking in their duties of adequately assessing and managing obesity in children. In a descriptive study Huang et al. (2011) conducted a nationally representative cross-sectional survey involving approximately 3,145 physician mailed surveys. Results revealed that less than 50% of providers utilize BMI for age and gender in youth. This variance was suggested to be associated with differences between family physician and pediatrician educational backgrounds on pediatric conditions (Huang et al., 2011).

Higgins et al. (2014) conducted a retrospective non-experimental design study to evaluate the relationship between excess weight and the ordering of lab or screening tests for children. This study involved children from a pediatric resident clinic in Chicago who were aged between 2 and 18 years old. According to Higgins et al. (2014), the population at the clinic comprised of 49% Hispanics and 33% African Americans. In this descriptive retrospective chart review, Higgins et al. (2014) discovered that documentation rates of children who were overweight or obese were quite low. Furthermore, such a lack of documentation could possibly delay early and crucial preventative measures for children. Higgins et al. (2014) examined individual patient charts that were determined to have patient BMI > 85th percentile and used the AAP recommendations for prevention, assessment, and treatment of child and adolescent obesity and overweight as a guide for their evaluation. Higgins et al. (2014) also found that primary care providers must be able to complete adequate assessments by first recognizing abnormal BMIs and risk factors in order to manage obesity. The study also revealed that less than 50% of children and adolescents considered to be overweight or obese had adequate documentation of their excess weight in the EMR. These findings leave approximately 50% of individuals that do not have adequate documentation, as well as those who may go undiagnosed and receive a delay in treatment.

All providers should strive to obtain the knowledge and potential to address this chronic condition by following the recommendations from the AAP. Unfortunately, according to Keehbauch et al. (2012), there are still many healthcare providers that do not follow set standards or nationally recommended guidelines and have poor documentation practices, losing opportunities to address this condition at its early stages in primary care settings. According to Keehbauch et al. (2012), lack of compliance with practice guidelines was caused by inadequate education of healthcare providers on methods of documenting obesity such as the EMR. Thaker et al. (2015) argued that it is essential that providers be able to identify and classify overweight and obesity competently in an effort to decrease its existence. Prevention begins at the primary care setting and therefore, providers must be well prepared using the best interventions, tools, and education, so that they can have the ability to achieve the best outcomes.

Educational interventions that incorporate EMR applications, as well as use of other resource methods for BMI improvement through use of prompts, have proven to be successful at improving standards of care for addressing childhood overweight and obesity. Bode, Roberts, and Johnson (2013), used a quasi-experimental design with a pre and post intervention chart review of over 300 charts, implementing the Find, Organize, Clarify, Understand, Select-Plan, Do, Check, Act (FOCUS-PDCA) model. The study demonstrated improvement in the provider's identification of adolescent overweight and obesity through the utilization of BMI percentile prompts within the EMR. The intervention of the evidence-based prompts guided providers to adequately identify and further document overweight and obesity in children. Simple adjustments in the primary care setting, such as the aforementioned interventions, can have positive outcomes in improving diagnosis and documentation. Bode et al. (2013) noted a significance of more than 20% from pre intervention to post intervention ($p < 0.01$). The study

acknowledged that although these interventions improved provider identification of overweight and obesity in youth, there were still some cases that were missed. Providing interventions such as the above-mentioned examples can facilitate timely and adequate patient centered care which addresses two of the six aims set in a report of the Institute of Medicine (IOM), in efforts to improve health care delivered (IHI, 2015). These two aims are that individuals receive patient centered care and timely care (IHI, 2015).

Coleman et al. (2012) conducted a large-scale study involving 700,000 outpatient visits with children and adolescents utilizing a pediatric weight management initiative. The study was conducted over a three year period during which there were significant improvements in diagnosis, documentation, and management of pediatric overweight and obesity. Utilization of EMR prompts, such as alerts to notate that BMIs were abnormal, along with clinical based recommended guidelines formed by expert committees for assisting providers with adequate assessments and management of pediatric overweight, led to improvements in provider assessments and documentation practices, and results of managing the treatable condition were achieved (Coleman et al., 2012). The use of computer assisted decision tools and EMR alerts or prompts proved to be significant as there was an improvement in the documentation of height and weight measured of 28% ($p < 0.01$). Furthermore, Coleman et al. (2012) revealed a 49% ($p < 0.01$) increase in diagnosed overweight and obesity of youths during the 3-year period of the study. Although their study showed improvement in documentation, identification, screening and counseling, the study had limitations as it had no randomization.

Another study conducted by Keehbauch et al. (2012) proved effective utilization of an EMR intervention would assist in the improvement of diagnosing and documenting overweight and obesity for primary care providers. The researchers utilized an EMR that automatically

plotted and charted the BMI, and in addition supplied education to providers. Keehbauch et al. (2012) revealed that not only were the EMR interventions that provided automatic BMI percentile plotting abilities well correlated with proper documentation and diagnosis of overweight and obesity, but these interventions were also consistent in meeting positive measures of identification of abnormal weight issues. One limitation of the study was the authors' failure to convey if physician's recognition of the identification of abnormal weight status would lead to performance of extended measures, such as any lab work that may result from the overweight or obesity status identified.

Saviñon, Taylor, Canty-Mitchell, and Blood-Siegfried (2012) demonstrated positive outcomes in a quasi-experimental design using a retrospective review of patient encounters of children ages 7 to 18 from a community health center. Race and ethnicities among the sampled charts included African Americans, Indians, Whites and Hispanics. The EMR was customized with evidence-based guidelines for prevention, screening and management of childhood and adolescent overweight and obesity. The EMR was upgraded with computer assisted tools and methods based on best practice guidelines to assist with identification, diagnosis, and management of overweight and obesity of children in a community health center setting. The approach was intended to provide practitioners or providers with quick access to valuable tools, such as templates, within the EMR to provide adequate screening for overweight and obese children. Based on this intervention, Saviñon et al. (2012) discovered a more than 60% improvement in adequate documentation of BMI and plotting, along with educational strategies to address overweight and obesity. The implementation of EMR customization with tools for addressing childhood and adolescent overweight and obesity provided efficient and expedited care within the visit encounter for providers. A limitation of the study included a small amount

of improvements over a brief period, weakening the generalizability. Nonetheless, the study may have sparked interest in producing a larger study or a randomized control trial, which may offer stronger evidence.

Tang et al. (2012) utilized a randomized control trial to evaluate the application of evidence-based tools within the electronic health record in improving the diagnosis and management of overweight, documentation of counseling, and the ordering of appropriate labs. This study involved adult patients aged between 18 and 65 years who had visited a physician from March 19 to September 20, 2010, whose weight and height were consistent with the calculated BMI of 27kg/m^2 - 29.9kg/m^2 . Thirty consenting physicians were randomized into two groups. The intervention group ($n = 15$) was supplied with electronic health record (EHR) evidence-based tools, and the control group ($n = 15$) used usual care methods. The intervention group provided education for providers on evidence-based guidelines and training of electronic health records with added tools for improving assessment and management of overweight conditions. Utilizing a tool within the EHR with an alert proved to be effective, by improving physician's abilities to recognize and identify overweight individuals. Tang et al. (2012) revealed that many individuals go undiagnosed in the early stages, thus placing themselves at greater risk for other comorbidities due to inadequate timely screening and treatment. This was also evident from physician surveys conducted by Tang et al. (2012), which provided perspectives of the usefulness of an evidence-based tool kit. Ninety-one percent of physicians acknowledged that the electronic alerts increased their recognition in individuals that were thought of as not having any weight issues. Furthermore, 80% of physicians surveyed reported that the tool was useful in promoting counseling and documentation of overweight and obesity. The study provides support that an effective EMR, coupled with educational interventions, can be successful in improving

screening, identification, and management of overweight and obesity. Although the intervention was successful, there were barriers reported by physicians which included strategies that were too time consuming to complete.

In a descriptive correlation study by Thaker et al. (2015) an EMR intervention was utilized involving a modified template for addressing well child care identification for children who were severely obese. The study sample included children ages 2 to 19 years of age, with a majority being minority populations consisting of African Americans and Hispanics. The template was not obese-specific. Rather, it was an expedited screening tool that addressed various areas specific in children, in addition to a prompt section in the assessment/plan to review weight management in all children despite being overweight or obese. Without interruption of workflow, the utilization of the template in the electronic health record resulted in a positive association with increased provider diagnosis of obesity and counseling for patients (47% vs. 34%, $p < 0.01$). In addition, the documentation of obesity led to improved physical activity counseling (23% vs. 9%, $p = 0.001$) and enhanced nutritional counseling (66% vs. 44%, $p = 0.001$). The findings in this study provided correlation that EHR tools and modified templates with evidence-based information or prompts can make a difference in providing early detection and diagnosis of obesity or any other related conditions. Findings from this study suggest that early identification can benefit both the patient and provider in reaching healthy outcomes and preventing high expenditures.

Muo, Sacajiu, Kunins, and Deluca (2013) conducted their study by providing a BMI prompt as a tool to nursing staff. The intervention utilized a chart reminder stamp on progress notes that was initiated by nurses and completed by the physician in documenting BMI. The findings revealed a positive difference in the number of charts that documented BMI ($p < 0.01$).

However, no changes were noted in diagnosis or weight plans documented by the physician. Although the study sample was small ($n = 406$), the authors concluded that a simple intervention such as BMI sticker prompts can improve documentation practices of BMIs, and improve screening and identification efforts to address childhood obesity. Limitations of this study included narrowness and a brief duration. Strengthening of this intervention in a future study may be possible and impactful if the study were conducted for a longer duration.

According to Jacobson and Gance-Cleveland (2011), providers are deficient in their duties of adequately identifying, assessing, and managing obesity in children. Improving on providing and adhering to the standardized and recommended guidelines set forth by experts such as the American Academy of Physicians, (AAP) the CDC, and the US Preventative Task Force agencies (USPTF), may hold the possibility of making headway into diminishing the escalated number of children in the nation that are considered to be overweight and obese. It is through educational efforts and interventions that improvements can possibly be attained in managing and preventing childhood obesity (Huang et al., 2011).

Limitations in Literature

Although recommended guidelines proposed by well recognized leading authorities and various interventions exist to identify and treat childhood obesity, the issue of overweight and obesity continues to be ambiguously approached within primary care settings (Richardson, Paulis, van Middelkoop, & Koes, 2013). Gaps in the literature, including a lack of understanding of why primary care providers do not adhere to guidelines and recommendations, continue to be present in society (Higgins et al., 2014). There is a need to search for best methods to improve primary care providers' adherence to evidence-based practices for all types of health issues that are encountered (Apovian & Gordon, 2014). This would include searching for best practices for

overweight and obesity in children. The implementation of quality improvement projects that allows for translation of evidence-based methods may be one way of making a positive change for improving care in healthcare settings (Kolic, 2012).

Purpose of Project

The purpose of the project was to improve BMI measurement, screening, identification, documentation, and assessment of overweight and obesity in children and adolescents ages 3 to 18, so that children with abnormal BMIs could be addressed and preventative measures could be taken by the clinic in a timely manner. Furthermore, it was intended that the clinic staff and provider would increase their knowledge and standards of care for addressing overweight and obesity in children and be up to date with evidence-based guidelines for delivering such care.

Benchmarks

The benchmark for this project is based on the Healthy People 2020 objective; Nutrition and Weight Status (NWS - 5.2). Healthy People 2020 establish and sets national goals and benchmarks to assist providers in improving care and outcomes for populations. This aforementioned objective calls for an increase the proportion of primary care physicians who regularly assess body mass index (BMI) for age and sex in their children or adolescent patients (U.S. DHHS, 2014). The baseline shows that 49.7% of healthcare providers regularly assessed body mass index (BMI) for age and sex of their child or adolescent patients in 2008 (HHS, 2014). Healthy People 2020's target goal is set for 54.7 a 10% improvement. For this project the clinic target goals is to improve use of BMI for screening, identification, and treatment/management recommendations of overweight and obesity by at least 10% or more.

Objectives

1. By June 6, 2016, 100% of the clinical staff (medical assistant, paramedic/lead medical assistant and DNP/provider) will attend a 20-30 minute educational training session provided by the DNP student. The purpose of the session will be to improve their knowledge regarding the standard procedure to obtain height, weight, and BMI percentiles for age and gender, plot and categorize BMI on growth charts, and demonstrate the ability to perform these functions.
2. By August 31, 2016, the clinic will demonstrate improvement in the process of identifying and managing childhood overweight and obesity care as evidence by:
 - a. The MAs will appropriately measure and document height, weight, and plot BMI on growth charts for 100% of pediatric and adolescent patients seen in the clinic.
 - b. The DNP provider will document any abnormal BMIs and order appropriate lab work and follow up care for at least 75% of pediatric and adolescent patients seen in the clinic.
3. By August 31, 2016, there will a 100% improvement in the standard of care process and behavior as the DNP will:
 - a. Increase adherence to utilizing recommended evidence-based guidelines and prompts in the identification, assessment and management for children and adolescents experiencing overweight and obesity as evidenced by documentation in patient records.
 - b. Provide early preventative measures as evidenced by documented abnormal BMIs on the problem list, as a diagnosis on the patient chart, and notations of timely follow ups to track progress.

Methodology

Design/Intervention Strategy

The quality improvement project used a descriptive design with a pre and post retrospective record review. This design was selected for use as it allowed for the feasibility of attaining readily available data that would be pertinent to understanding how well the clinic is doing in standard of care processes for identifying and addressing childhood overweight and obesity. One element of the intervention was to provide education and training sessions to clinic staff, along with BMI reminder prompt and components of one pediatric toolkit that included an algorithm and a 5210 color coded clinical growth chart. Both components are based on 2007 recommendations from the AAP and expert committee consensus.

The Park Nicollet pediatric obesity tool kit from the Minnesota American Academy of Pediatrics was also used in the intervention at the clinic (See Appendix G). This tool kits is based on the 2007 AAP expert committee recommended guidelines to assist providers in addressing childhood obesity (Park Nicollet Institute, 2012). The tool kit includes algorithms and step by step methods to screening, assessment and management recommendations for providers. This tool kit was utilized to provide reinforced education and guidance to staff and provider at the clinic towards improvement of childhood obesity management.

Sampling

Upon IRB approval, random chart review was conducted to evaluate patient records for the pre and post retrospective chart reviews. The sample included 100 randomly selected patient records (50 pre-intervention and 50 post-intervention) of any children and or adolescents, ages 3 to 18 years old, who were seen at the clinic during the time frame of February 1 through September 15, 2016. Other criteria for selecting the sample included having a recorded BMI ≥ 85

percentile for age and sex. A total of 100 patient charts were selected randomly for the entire project. Fifty patient records were selected pre-implementation of the intervention for children who had a recorded visit between February 1 and May 1, 2016. The purpose of the record review was to gain baseline data regarding documentation of BMI, and was later compared to post implementation data. Likewise, 50 patient records were selected post implementation for child encounters that took place between June 1 and September 1, 2016. For the post-implementation record review, every other record for a child or adolescent ages 3 to 18 years old with a documented BMI of > 25 or > 85th percentile was selected, until a total of 50 charts were identified. This random selection process allowed for an equal chance of inclusion for a sample of pediatric patients. The post-intervention charts were evaluated for documentation of BMI, demographics including age, race/ethnic, and gender as well as any documentation of risk factors related to overweight/obesity, laboratory orders or results, progress notes, and follow up visits. The form used to collect this data is listed in Appendix N.

Stakeholders

According to Moran (2014), the term stakeholders relates to all individuals who will be involved, affected, and may pose resistance in the implementation of the quality improvement project. According to Moran (2014), identifying the main stakeholder can provide positivity to spearhead the project. The stakeholders involved in the quality improvement project include a DNP/provider and two medical assistants. Other stakeholders that benefited, although were not directly involved in the quality improvement project, included the office manager and the administrative clerk, the patients seen at the clinic, and the general community.

Setting

The setting for the quality improvement project took place at a small primary care clinic privately owned and operated by a DNP. The clinic is situated in a small city in southern Texas. The majority of the population seen at this clinic are Hispanics and ages range from birth to advanced/elderly. The majority of patients are insured through Medicaid or private insurance. The clinic consists of a small staff of five individuals who are bilingual and have a minimum education of one year of college or above. The clinic is situated in the outer city limits but near two main acute care facilities.

Procedure Plan

The plan to implement a quality improvement project that would improve the clinics screening, identification and assessment for childhood obesity was discussed and agreed upon by the student's project committee and members of the clinic. The DNP student utilized an algorithm from the Park Nicollet tool kit, BMI for age percentile growth charts from the *5-2-1-0 Let's Go tool kit* that were color coded, and BMI prompts on a super bill (See Appendix E,F,G & K). The purpose of the super bill prompt process was to improve BMI measurements and acknowledgement that would then guide the provider in properly screening, identifying, documenting, and assessing abnormal BMIs for children and adolescents seen at the clinic. The DNP student provided a timeline chart for carrying out each task or process for the quality improvement project (Appendix M).

Description of the procedure. The procedure plan included conducting a pre chart audit, pre-test for knowledge in regards to processes for identification and screening of overweight and obese children, educational sessions, and a posttest to assess the staff's comprehension and improvement of knowledge regarding care for children with abnormal weight conditions (See

Appendix J). The DNP student provided a 30 minute training session and a hands on training with return demonstration that was completed June 6 – June 10, 2016. The training was given to the provider and two medical assistants at the initiation of the project that included a written test prior to the educational session and immediately after the educational session. The two medical assistants received training regarding how to appropriately attain height and weight measurements for children. These two medical assistants were further instructed on how to accurately interpret the BMI percentile on the clinical growth chart in the EMR, and further document the BMI on the super bill for the provider to utilize in guiding the screening process.

The DNP student then provided education to the provider on use of the Park Nicollet algorithm, the super bill BMI prompt, and how to correctly use the clinical growth charts to guide identification, screening, assessment and management for overweight and obese children. The DNP student educated the provider on the AAP guidelines for addressing overweight and obesity in children. The DNP student also directly observed staff and collected data based on observation/performance (See Appendix I). Observation/performance data was collected post implementation of the trainings and during clinical hours spent at the clinic.

The variables that were measured pre and post intervention through conduction of direct observation by the Doctor of Nursing Practice student, and from the retrospective chart audits prior to and after completion of the project, included demographics and the variables of age, gender, race/ethnicity, height, weight, and BMI. Additional post-intervention data collection included any documentation of risk factors (such as family history of obesity, diabetes, high cholesterol or cardiac disease), diagnoses and health conditions, documentation of ordered labs such as Lipid panel, AST/ALT, and fasting blood sugar and results. Post intervention patient records were also audited utilizing a chart audit checklist for documentation of patient education

or recommendations, review of provider progress notes for documentation of abnormal BMI or weight status, and review of any patient follow up visit notes specifically related to evaluation or for follow up on the diagnosis of overweight or obesity/abnormal weight gain or abnormal BMI (See Appendix N). The DNP student reviewed the 50 randomly selected post-implementation charts to determine if the provider had followed the AAP guidelines for using BMI for screening children who are overweight or obese.

Objectives. The objective for the project focused on improving staff knowledge of proper height, weight and BMI measurements for screening, identification, documentation, and assessment for those children, ages 3 to 18 years, who were found to be overweight and obese through implementing the use of the recommended tool kits that followed AAP guidelines and BMI prompts for the stakeholders. The intended outcomes consisted of implementation of the clinical practice recommended guidelines algorithm and tool kits, along with active participation and completion by the providers and staff, resulting in improved measurements, screening, identification and documentation of normal and abnormal BMIs on the patient's problem list, appropriate ordering of lab tests, identified risk factors, diagnosis of overweight and obesity, and recommendations and follow up visits scheduled to track weight progress. The specific objectives are listed below.

Timeline for project completion. The proposed project began upon gaining IRB approval, as well as final approval from project committee members. The set timelines were realistic and correlated with the goals or objectives of the specific project. The set timeline for the project was from June 1, 2016 through November 1, 2016 (See Appendix M). The first week, or initial phase, included conduction of the pre-auditing of 50 patient charts to gain a baseline, and comparison to the post audit of 50 patient charts after completion of the quality improvement

project. Upon attaining the baseline data from chart audits, educational sessions for the staff were conducted to include a pre and post test to determine a percentage of improvement in the staff's knowledge regarding the use of BMI measurement for screening overweight and obese children, as per the expert committee and AAP recommendations. Staff was also educated on use of the clinical growth chart for age and sex, as well as on the use of the Park Nicolett algorithm, and use of the super bill template with the BMI prompt. Each specific phase and component of the project was given a date with a timeline (See Appendix M).

Organizational readiness. Within the clinic, the idea of change through the implementation of a QI project was carefully discussed and presented to the staff. The staff and provider were made aware of the issues or problems identified and methods that would be used to improve these areas. Staff ideas and input were taken into consideration during and throughout the QI project. The staff had voiced understanding and acknowledged their willingness or readiness to change by providing feedback and suggestions on how to address the issues identified within the clinic. The provider at the clinic agreed to implement change utilizing recommended guidelines and tool kits that have proven to be successful, and felt that it would be cost effective for both the patients and clinic to address the preventable condition early in order to avoid future complications and expenditures. Development of a detailed plan that would provide better details of what would be required for the QI project was then initiated and provided for the clinic.

The successful completion of the quality improvement project intervention required complete participation by the direct stakeholders and the clinic employees, including two medical assistants, the office manager, and the Family Nurse Practitioner who is the clinic employer. Each employee and the employer were invested in the project and demonstrated great

participation throughout the process.

The stakeholder analysis assisted by prioritizing the power of importance of each member, strategies to consider for each one of the stakeholder, and to assess for organizational readiness for change. All members of the project were updated, were productive, and remained interested in the project. Management of stakeholders can assist in keeping all members interested and actively involved, as well as allow for input into making a project successful and have a smoother process (Mind Tools, 2016). The DNP student kept all stakeholders well informed and interested which provided facilitation of the project.

Utilization of a valuable tool such as the strengths, weaknesses, opportunities and threats (SWOT) analysis can provide a better understanding and direct a quality improvement project that can provide positive changes (Moran, 2014). Hence, a SWOT analysis was compiled for the clinic with recommendations from all stakeholders (See Appendix L). This tool provided a better understanding and direction for the quality improvement project's ability to be successfully completed. The SWOT analysis further assisted in prioritizing and placing all of the strengths among the stakeholders, placing other threats into perspective, and a plan was compiled to address any barriers.

Within the clinic, the idea of change through the implementation of a QI project was carefully discussed and presented to the staff. The staff and provider were made aware of the issues or problems identified and methods that would be used to improve these areas. Staff ideas and input were taken into consideration during and throughout the QI project. The staff had voiced understanding and acknowledged their willingness or readiness to change by providing feedback and suggestions on how to address the issues identified within the clinic. The provider at the clinic agreed to implement change utilizing recommended guidelines and tool kits that

have proven to be successful, and felt that it would be cost effective for both the patients and clinic to address the preventable condition early in order to avoid future complications and expenditures. Development of a detailed plan that would provide better details of what would be required for the QI project was then initiated and provided for the clinic.

Organization resources/business plan. A business plan was developed and presented to the clinic to inform about the potential benefits of conducting a quality improvement project that had the potential to improve the standard of care processes related to childhood overweight and obesity. The purpose of the business plan was to provide the clinic with costs and benefits of conducting the quality improvement project. It also provided a visualization for the clinic on specific costs of materials, cost of time spent by staff or personnel to attend trainings, the amount of personnel needed to complete the project, and potential revenues that could be achieved for improving standard of care processes founded on evidence-based guidelines (See Table 1).

Table 1

Business Case

Criteria	Current Standard of Care Processes at VHC	Proposed Quality Improvement Project
Patients diagnosed with overweight/obesity related health conditions attributed	None documented or coded with diagnosis	Increased identification and assessment that would lead to better management
<u>Materials/supplies</u>	None	Total \$150.00
Copies		\$50.00
Park Nicollet Tool kit		\$50.00
5210 Let's Go-component		\$50.00
Tape, tacks, paper, printer ink		
Trainer-Nurse Practitioner Salary (for 1 hr. per week for 8 weeks)	None	\$65.00 hr. to deliver education (\$520.00)
Medical Assistant x 2 weekly (1 hr. training each week for 8 weeks)	\$10.00/hr. x 2 (20 x 40 hrs.= \$800)	Total (\$810) per week 10.00 hr. x 2 x 1 hr. during lunch/before or after work
Improved patient self-care on weight issues	N/A	Yes (\$2,000-3,000) yearly
Improved provider up to date with evidence-based practices	No	Yes Revenue (\$1,000-\$2,000) potential earnings annually for returned office visits for management.
Increase patient and staff satisfaction and education	N/A	Yes
Direct medical costs of childhood obesity	Over 10 billion dollars are spent annually for obesity and its related conditions	Obese children treatment costs (approximate total over \$3,000 a year, compared to the cost of a normal weight child that may be approximately \$800 annually)
Regular patient visit	\$50-\$60	N/A
Patient visit for abnormal weight and related health conditions	None being performed	(\$50.00 patient visit) Based on well child exam/follow up for abnormal weight/re-evaluation
Friends and family interest in weight management	\$0	\$50.00-\$60.00 per visit plus any added lab work/depending on insurance status. Increased revenues for office may total up to \$5,000-\$10,000 per yr.

Challenges to implementation. Challenges toward implementation of the project at the VHC clinic were minimal being that the staff was small and consisted of only five employees. Initially, the challenges included trying to ensure that the staff had an ample amount of super bill templates with BMI prompts available. Constant communication with the office manager assisted with attaining access to the super bill template to be able to make copies when needed by all staff members. Facilitators of the quality improvement project included that the DNP was highly motivated and the sole owner of the clinic. Although minimal, resistance to gain consistency in ensuring all children removed their shoes prior to being weighed was one challenge that eventually was resolved. The MAs reported that although most of the children were weighed with their shoes off, there was still a few at the beginning of the project that did not comply with the request. During a debriefing with the staff, the DNP student suggested that children who would resist taking off their shoes during the triage should be asked to take off shoes during the encounter with the provider, and then be weighed. The provider agreed that all weights should be conducted prior to the encounter to avoid a flow of patient care, so the staff agreed to attempt their best to ensure all children and their family members understood the importance of obtaining an accurate weight by having all children and adolescents remove their shoes prior to stepping on the scale.

Evaluation Plan

The Kirkpatrick evaluation model was used to provide an efficient method of evaluating the implementation of the quality improvement project at this privately owned family practice clinic. According to Rouse (2011), evaluation models are beneficial as they provide valuable information in areas that can be further improved to generate successful outcomes. The Kirkpatrick evaluation model has been considered a well-rounded and successful process to

evaluate the effects of training or education (Abdulghani et al., 2014). The model consists of four levels that include reaction, learning, behaviors and results (Kirkpatrick Partners, 2015). Levels one, two, and three are significant in reaching the final outcome improvement reflected in level four, which according to Dewhurst, Harris, Foster-Bohm, and Odell (2015), is the reaching of a steadiness that remains in place within the organization.

The Kirkpatrick evaluation assisted in conducting evaluation of the staff's completion and comprehension of each task throughout the project. Each level was used as a guide to determine the staff's understanding of the material and educational sessions, their behaviors as measured by direct observation by the DNP student, and their overall comprehension of each phase of the project through discussions and debriefings (See Appendix O).

Data Collection Plan

Data collection methods were used to collect valuable information that could be further evaluated and analyzed to gain a better understanding of the specific problem or topic of interest. Specifically, the data collection methods conducted by the DNP student included retrospective chart audits of patient visits pre and post intervention, direct observation through use of an observation checklist, and a data collection sheet to gather information of the accurate measurements of height, weight, and BMI calculation, as well as documentation practice for other variables (See Appendix I & N). A pre and posttest was developed by the DNP and entailed questions that covered how to accurately measure height and weight, as well as covered basic information that would assist the staff and provider to become more knowledgeable on screening processes for children who are overweight and obese. A pre and posttest provided further valuable information and revealed improvements in the comprehension of staff in regards to interventional education and trainings. The pre audit included extraction of basic

demographics and variables through use of a data collection sheet. Basic demographics such as age, race/ethnicity, and sex were collected and compared to post sample population. Variables extracted from pre and post chart reviews included BMI percentiles ≥ 85 , height, weight, and whether there was documentation of risk factors, diagnosis, lab work orders if indicated, recommendations such as education on diet, exercise or referral to a specialist, progress notes notation of abnormal BMI, and a follow up to discuss any abnormal weight status or BMI.

Data Analysis Plan

Once all data was collected it was then reviewed, double checked and keyed into an excel spreadsheet. It was then further analyzed utilizing a Statistics Program for Social Sciences Version 22 (SPSS v. 22). All data entered was unidentifiable and kept secured in a designated cabinet behind a locked door. All data was reviewed at the time of data entry by both the DNP student and the provider to ensure for accuracy. Descriptive statistics were conducted to evaluate percentage, mean, median and standard deviation of basic demographics. Percentages and comparison means were conducted to assess the pre and post chart documentation of all variables.

IRB Approval Process

Institutional Research Board (IRB) approval was sought from the University of the Incarnate Word IRB. The proposed quality improvement project did not involve research with human subjects. The project and interventions provided for the improvement of standardized practices and care processes that should be upheld by all healthcare providers. All members/stakeholders involved in the quality improvement project were properly advised and provided with clear interpretations of the projects purpose, timelines, and benefits. The quality improvement project was approved by the IRB based on exempt review status.

Results

Analysis of Data

Measures of central tendency, such as mean, were conducted for variables of age, weight, height and body mass index percentiles, as well as frequencies. Other variables that were collected and used to meet the objectives were risk factors, diagnosis and/or related health conditions, laboratory tests ordered, recommendations, progress note documentation, and follow up documentation. All of these variables had either nominal or ordinal level data and were used in descriptive statistics to conduct frequencies and percentages.

Descriptive statistics were used to summarize the data collected for the basic demographic characteristics and variables of the pre audit chart review sample ($N = 50$), and the post audit chart review sample ($N = 50$). The demographic characteristics included age, sex, race, ethnicity, height, weight, and BMI percentiles (See Table 2). The percentages, mean, median and standard deviation were computed using descriptive statistics. Table 2 describes that a majority (86%) of the patient records that were reviewed were of patients who defined themselves as Hispanic with a mean age of 13.9 years. The gender distribution from pre chart review was 46% female compared to the post chart review that revealed 52% females and 48% males. The post chart review revealed a slight difference from pre audit results as weight mean was a little more. See Table 2 for complete results.

Table 2

Basic demographic characteristics from Pre and Post Chart Reviews

<u>Race, n (%)</u>	<u>Pre Chart Review</u>	<u>Post Chart Review</u>
White	7 (14%)	0%
African American	0%	0%
Unreported	43 (86%)	50 (100%)
<u>Ethnicity</u>		
Hispanic	43 (86%)	50 (100%)
Non-Hispanic	7 (14%)	0%
<u>Sex</u>		
Female	23 (46%)	26 (52%)
Male	27 (54%)	24 (48%)
<u>Age (years): [mean (SD)]</u>	13.8 (3.53)	14.32 (2.47)
<u>Weight (pounds) [mean (SD)]</u>	162.32 (52.42)	162.21 (27.05)
<u>Height (inches) [mean (SD)]</u>	62.24 (5.72)	63.22 (3.76)
<u>Body mass index (BMI): [mean (SD)]</u>	95.51 (4.14)	94.46 (3.76)
<u>Payer Source (%)</u>		
Insurance	14 (22.6%)	8 (16%)
Medicaid	25 (40.3%)	26 (52%)
Self Pay	11 (17.7%)	16 (32%)
(N = 50)		

Objectives

Objective 1. The results of the project revealed that objective one was met as, by June 6, 2016, 100% of the staff (two MAs and one provider) participated and completed a seven question structured pretest, a 20-30 minute training, and a post-test immediately following the training. There was 100% improvement of the staff's knowledge as evidenced by an increase in test scores from pre to post completion of the testing and trainings. There was a positive percentage improvement in the staff scores from pretest to posttest. This further solidified the accomplishment of meeting objectives one's goal. Figure 1 reveals positive improvement of the three staff members' scores prior to and post completion of educational training sessions.

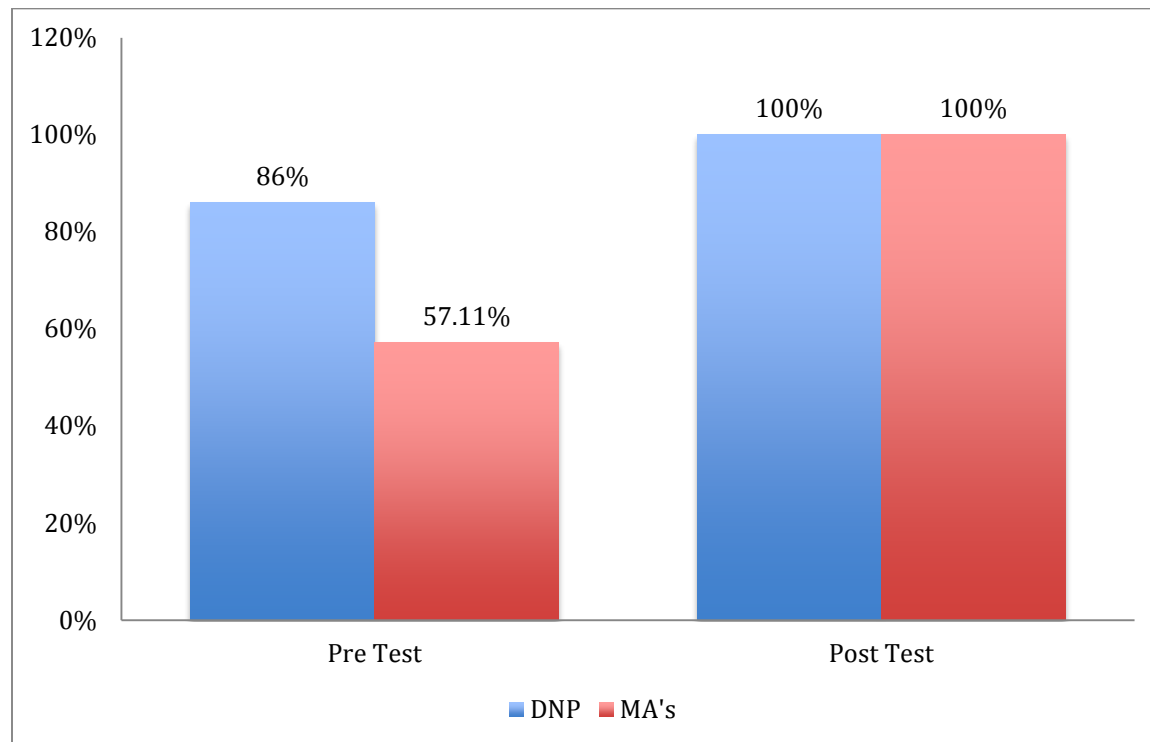


Figure 1. Comparison of the staff's pre and post test scores.

Objective 2. Objective number two was met as by August 31, 2016, the clinic demonstrated improvement in the process of identifying and managing childhood overweight and obesity care as evidenced by the MAs direct observed behaviors by the DNP student, and chart audits of their performance of correctly measuring and documenting of height, weight, and plotting of BMI on growth charts for pediatric and adolescent patients seen in the clinic. There was a 75% improvement in the DNP's documentation of abnormal BMIs and the ordering of appropriate lab work and follow up care for pediatric and adolescent patients seen in the clinic. Table 3 and Figure 2 below depict that there was a 90% or more improvement among all the variables between pre implementation of the project to post implementation.

Table 3

Pre Chart Audit Review on the Electronic Medical Record (EMR)

<u>Documentation on EMR</u>	<u>Pre Chart Audit Review (%)</u> <u>N = 50</u>	<u>Post Chart Audit Review (%)</u> <u>N = 50</u>
Risk factors	10%	100%
Diagnosis and/or other health related conditions	10%	100%
Lab work ordered	10%	100%
Recommendations	0%	100%
Progress notes	0%	100%
Follow up visit	0%	100%

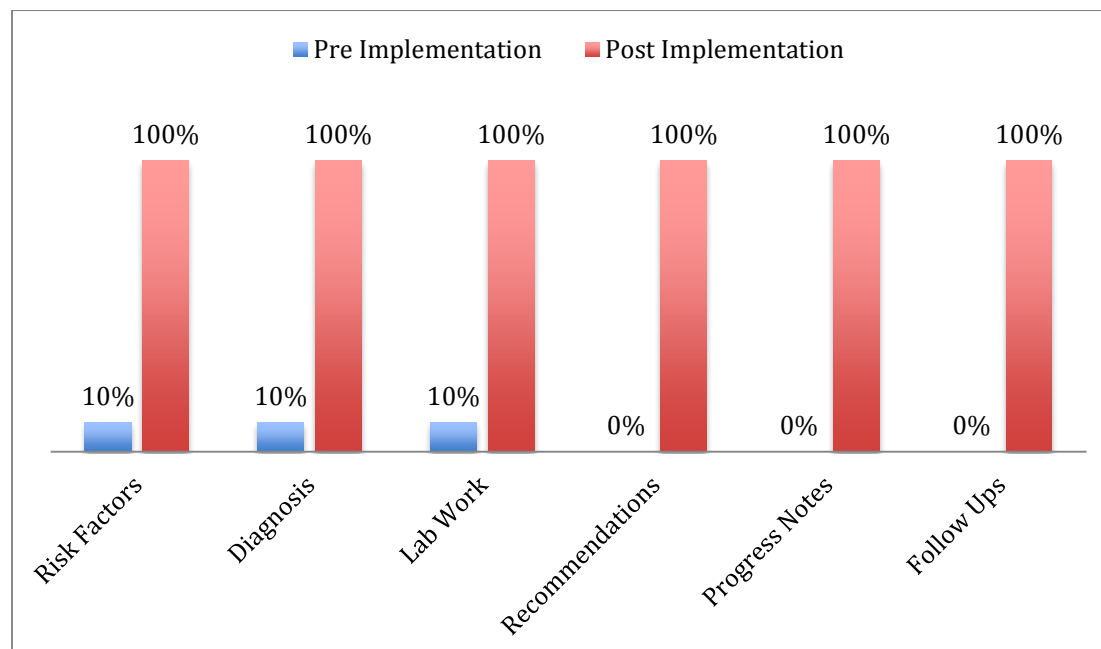


Figure 2. Pre and post chart audit results.

Objective 3. The third objective for the quality improvement project was met as by August 31, 2016, there was 100% improvement in the standard of care process and behavior of the DNP in adherence to utilizing recommended evidence-based guidelines and prompts in the identification, assessment and management for children and adolescents experiencing overweight

and obesity as evidenced by documentation in patient records. The post chart audits revealed a positive percentage in the improvement of the provider's use of AAP recommended guidelines for addressing childhood overweight and obesity. The provider's documentation in the patient charts of abnormal BMIs on the problem list, diagnosis on the patient charts, and notations of timely follow ups to track progress further increased the ability to provide early preventative measures for this young population of children with abnormal weight conditions. See Figure 3 below.

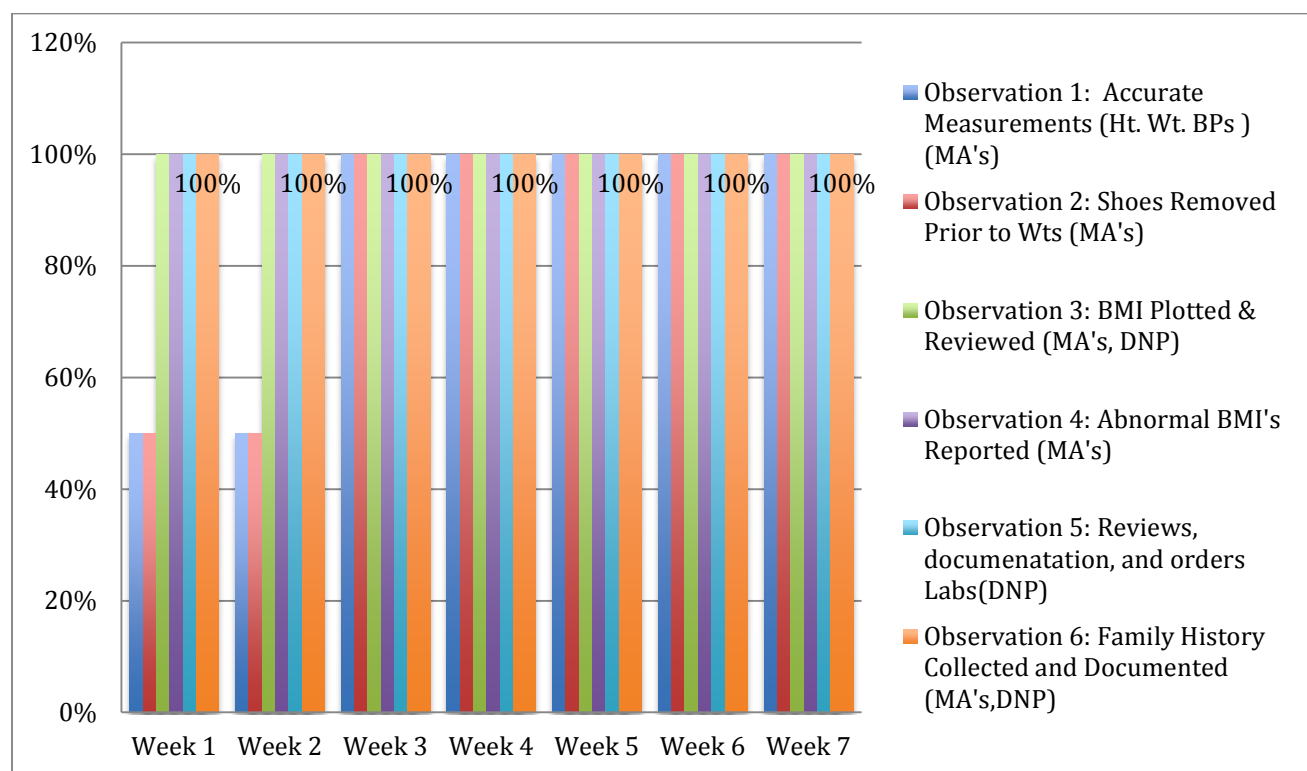


Figure 3. Staff's performance behaviors over a period of seven weeks.

Summary of Findings

The results of this quality improvement project revealed the successful improvement in a primary care clinic's identification, screening, documentation and assessment for addressing childhood obesity. Furthermore, the results indicate that an educational intervention that

incorporates evidence-based material from tool kits and BMI prompts can have an impact in enhancing standard of care processes and provider adherence to guidelines for children who are overweight and obese. The project purpose was to improve BMI measurements, screening, identification, documentation and assessment practices in a small primary care clinic. The three objectives that guided such improvements were met as follows; Objective one: 100% of the staff participated and completed the 20 - 30 minute educational training session, hands-on demonstration of proper measurements provided by the DNP student, and increased their knowledge regarding standard procedures for measurements that included height, weight, BMI percentiles for age and gender, and plotting and categorization of BMI on growth charts. Objective two was also met by the set date of August 31, 2016. The clinic demonstrated 100% improvement in the process of identifying and managing childhood overweight and obesity care as evidenced by direct observation and chart audit data revealing the MA's measurement and documented height, weight, and plotted BMI on growth charts for 100% of pediatric and adolescent patients seen in the clinic during the projects implementation. The DNP provider also documented any abnormal BMIs and ordered appropriate lab work and follow up care for at least 75% of pediatric and adolescent patients seen in the clinic. Objective three was also met, as by August 31, 2016, there was 100% improvement in the standard of care processes and performance behaviors of the DNP in having increased adherence to utilizing recommended evidence-based guidelines and prompts in the identification, assessment and management for children and adolescents experiencing overweight and obesity as reflected by the 100% documentation rate in patient records. These percentages also provided early preventative measures, evidence showed documented abnormal BMIs on the problem list, diagnosis on the patient chart, and notations of timely follow ups to track progress.

Discussion and Conclusions

Discussion of Main Findings

According to Rausch, Rothbaum Perito, and Hametz (2011), healthcare providers in primary care settings are lacking in their consistency of best practices of following recommended guidelines for treating overweight and obesity in children. According to Shaikh, Nettiksimmons, Joseph, Tancredi, and Romano (2012), there continues to be an inconsistent utilization of BMI percentiles across various healthcare settings that can ultimately lead to poor documentation practices and decreased quality of care. The quality improvement project findings provided positive results that will lead to improved standard of care processes at the primary care clinic. Documentation of BMI measurements, risk factors, diagnosis, lab work, recommendations, progress notations, and follow ups to discuss overweight or obese conditions have improved. Rates of children with overweight and obese categorizations were identified and consisted of high percentages. The DNP/provider was quite impressed by the findings and decided to improve on this area of study and on this preventable condition.

Over the span of three months there was 100% improvement in documentation of BMI measurements and plotting in the clinic. There was also an increase in the documentation of abnormal BMIs in the progress notes. The rate of overweight and obesity was highly prevalent in the clinic population that was dominantly Hispanic and insured. The results showed that providing evidence-based trainings is linked to better screening, identification and assessment of childhood overweight and obesity. Implementation of quality improvement projects that instill evidence-based methods and guidelines or recommendations into practice settings have the potential to promote positive change in practice behaviors in primary care settings, and further encourage health care providers to adhere to these practices.

Implications for Practice

Advance practice registered nurses (APRNs) are strategic facilitators of delivering best care practices for addressing the prevalent conditions of overweight and obesity in children. They are vital members of the health care team that can instill positive communication and change in society. Although primary care providers have access to many EHR tools that are founded on evidence-based guidelines to deliver care, there continues to be a lack of utilization of best approaches to meet the needs of children with obesity. The implementation of a quality improvement project utilizing tools and resources that are evidence-based provides an effective strategy to guide primary care providers in adhering to recommended guidelines and improving standards of care. Various tools exist that can supplement education to providers which may increase their knowledge, improve adherence to recommended guidelines and assist in achieving positive health outcomes for their patients. Quality improvement projects are an initial start at making a positive change in addressing the reversible condition of childhood obesity, although more research is needed to assess provider behaviors in utilization of recommended guidelines in their practice settings.

Limitations

The quality improvement project provided improvement in addressing childhood overweight and obesity in a primary care setting. Although the results revealed a success at meeting all objectives and improving standard of care processes, the sample size was small ($N = 100$), as was the staff that consisted of three individuals. Generalizability of the results may not be consistent across all primary care clinics in a small city.

Recommendations for Future Sustainability of Project

To maintain sustainability of any DNP project depends on participation of all stakeholders involved and any future employed staff at the clinic. Sustainability can further be achieved in this organization if the staff continues to build upon their knowledge by maintaining up-to-date education of evidence-based practices in the years to come. Sustainability is vital to prevent a relapse of old habits and further prevent success of dealing with this chronic condition of obesity. The provider/owner has decided that he will continue to mentor DNP students only in hopes of adding to this current project for improving and addressing childhood obesity. Expansion of this project will definitely add worth to the clinic, and more importantly ensure that children affected by overweight and obesity are provided with quality and timely care. Another proposal for increasing the chance of sustainability is to advocate that this current project be provided as a topic for incoming DNP students in the future, in which to inspire another avenue of approach. This will provide expansion for the project and more importantly adds to improvement of this chronic issue.

Relevance to Nursing Practice for APRN with DNP

The DNP degree prepares APRNs to enhance their experiences, knowledge, advanced clinical skills, and critical thinking abilities to continue to improve healthcare well into the future. The DNP student, a current APRN, was part of the interdisciplinary team involved in bringing about positive change in a primary care setting through implementation of a quality improvement project. The team will consist of the primary care provider and staff at the clinic. Together, the stakeholders will make the interdisciplinary team that will collaborate to engage, as reflected through the eight DNP essentials, which according to the American Association of Colleges of Nursing (AACN, 2006), depicts a collection of the valuable elements and

proficiencies that all APRNs should acquire. Each of the roles describes important processes that potential DNP graduates should be performing or achieving as they progress through a DNP program. According to Moran (2014), progressing through a DNP program allows a transitioning of the APRN to be proficient at addressing the complexities in the evolving health continuum that DNP students complete.

Through the completion of a microsystem assessment, needs assessment, and scholarly quality improvement project, the DNP student is illustrating and mirroring the DNP essentials. Through collaborating with health care professionals, performing rigorous collection and analysis of data through observations, interviews, and questionnaires, the DNP student is demonstrating the AACN (2006) DNP essentials; I through VIII. According to Moran (2014), the DNP's completion of the scholarly project will reflect all of the competencies as well as resonate a higher level of nursing proficiency.

The DNP plays a critical role in the interdisciplinary team, bringing expertise and leadership to reach positive outcomes in healthcare. The DNP will translate and bring about sustaining evidence-based guidelines to continue improving quality, safety and diverse care needs for chronic conditions in primary care settings. Furthermore, the APRN prepared as a DNP, will only enrich the profession and encourage future improvement in research and its dissemination.

Conclusion

Childhood overweight and obesity are health issues that require much attention and effort by all healthcare providers, including physicians and nurse practitioners. Through the utilization of educational efforts that offer evidence-based information based upon recommended guidelines from leading authorities such as the AAP, possibilities of achieving positive outcomes are much

more likely. The successful completion of a quality improvement project led by DNP students within the microsystem setting provided an opportunity to showcase the translation of evidence, and that will pave the way for enhanced care in the primary care setting, as well as enhancement of future translational research for improving outcomes.

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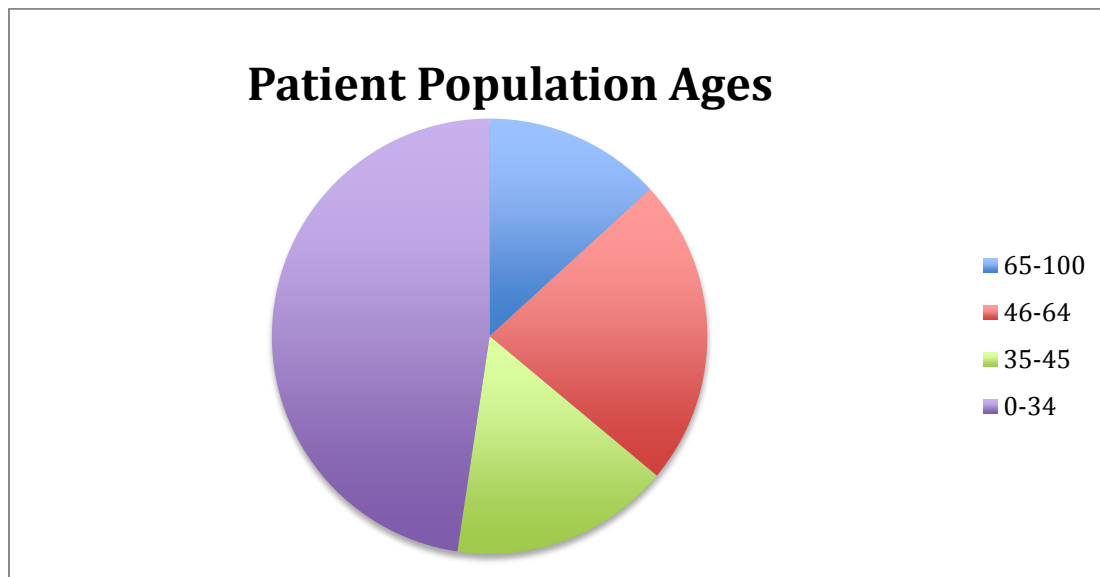
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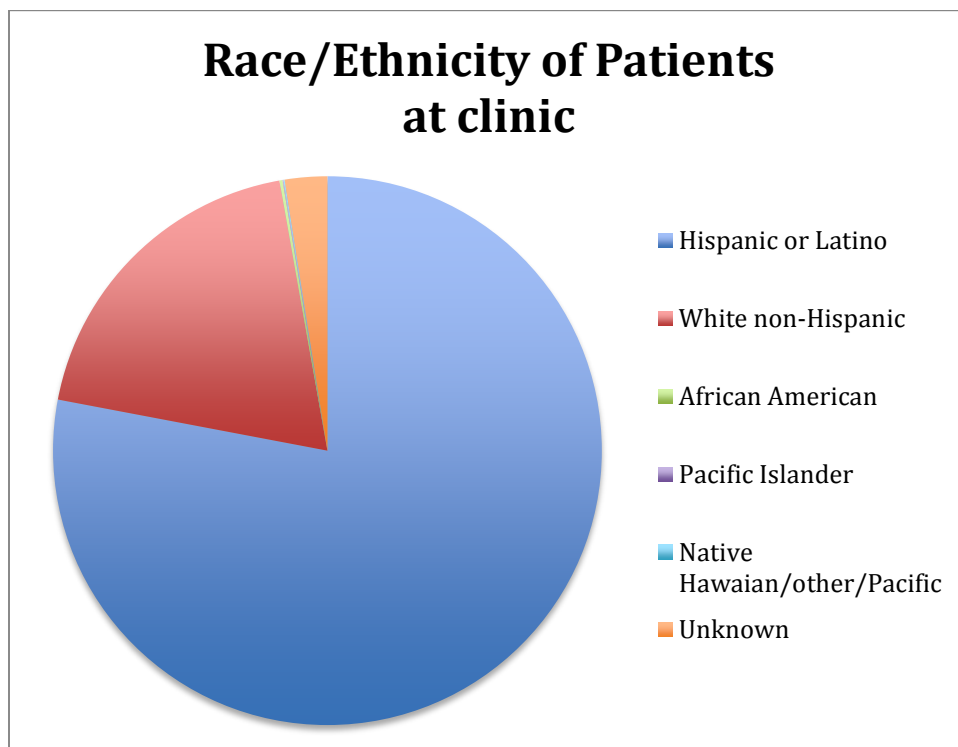
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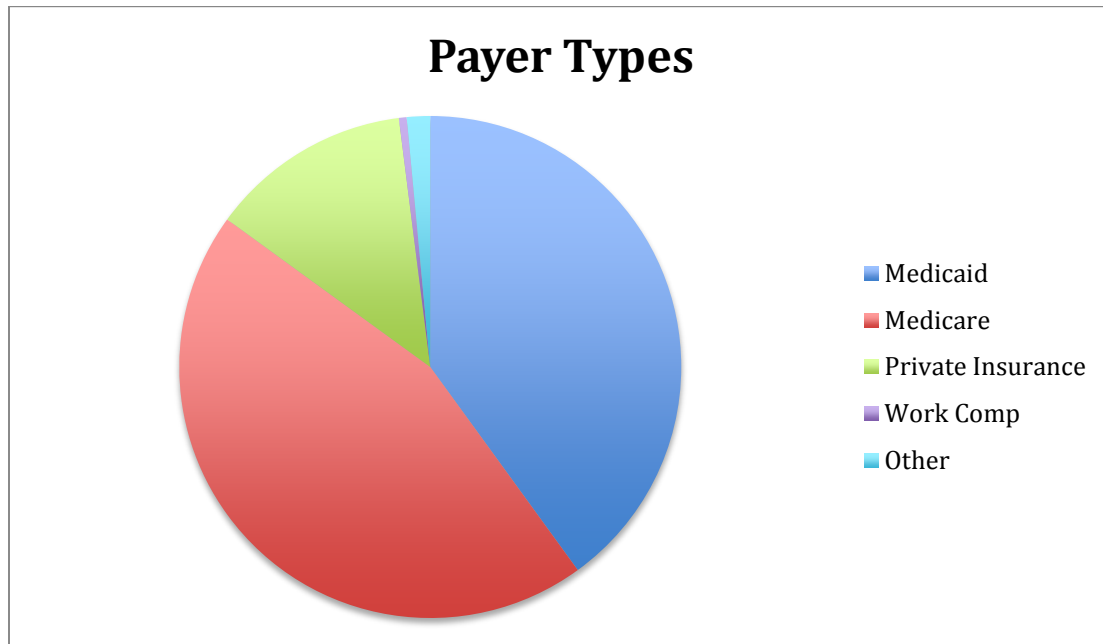
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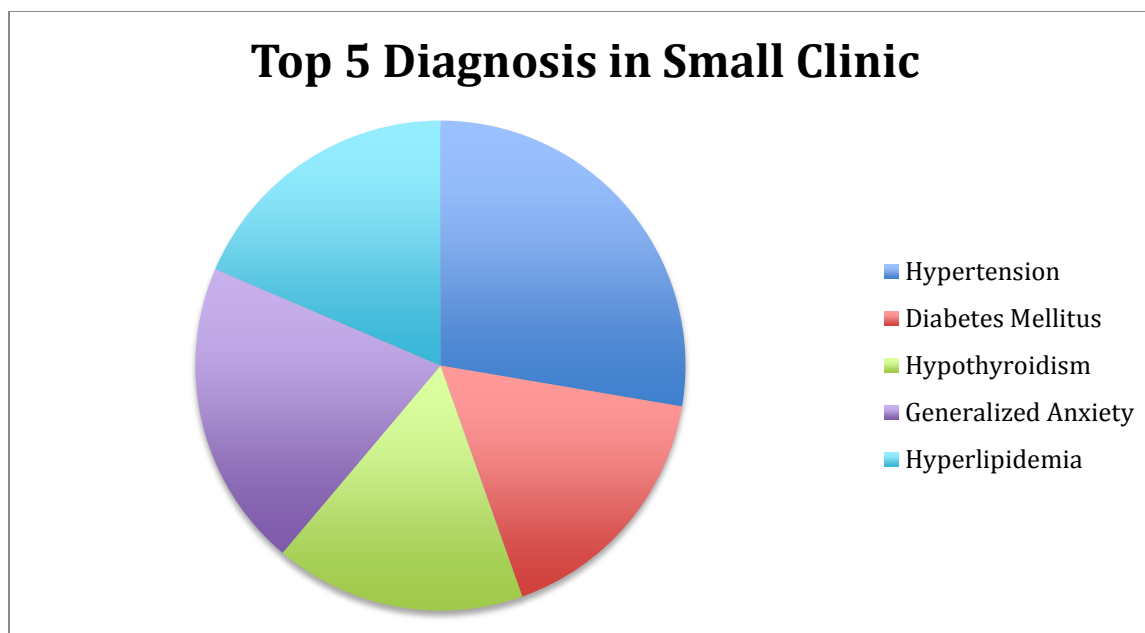
Appendices

Appendix A: Patient Population Age at the Clinic



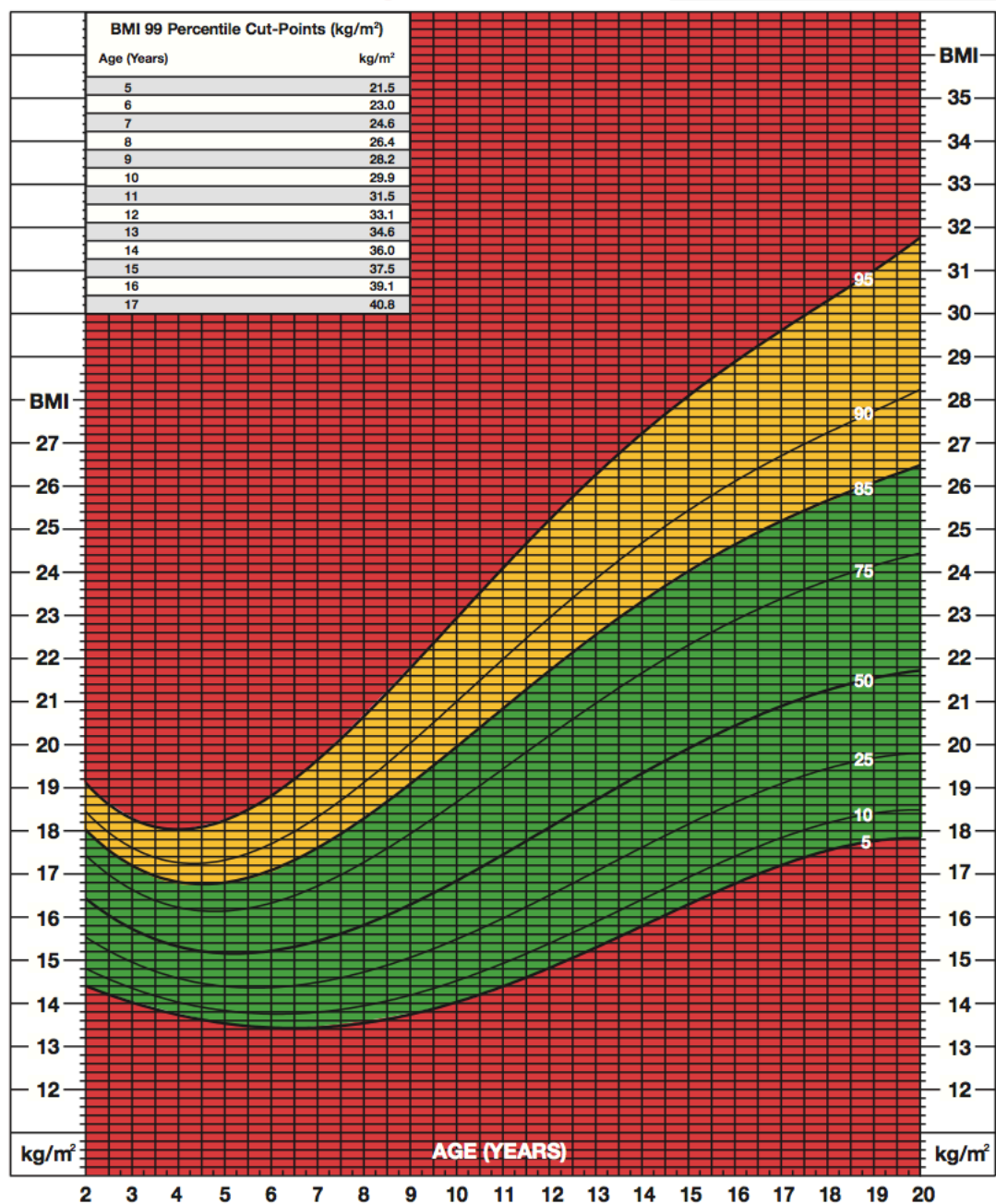
Appendix B: Race/Ethnicity of Patients at the Clinic

Appendix C: Payer Types

Appendix D: Diagnosis by Group in Small Clinic

Appendix E: Growth Chart Prompt

2 to 20 years: Girls Body mass index-for-age percentiles

metric system: $\text{weight}(\text{kg})/[\text{height}(\text{m})]^2$ English system: $\text{weight}(\text{lb})/[\text{height}(\text{in})]^2 \times 703$ 

Modified by Let's Go! 03/28/08.

Published May 30, 2000 (modified 10/16/00).

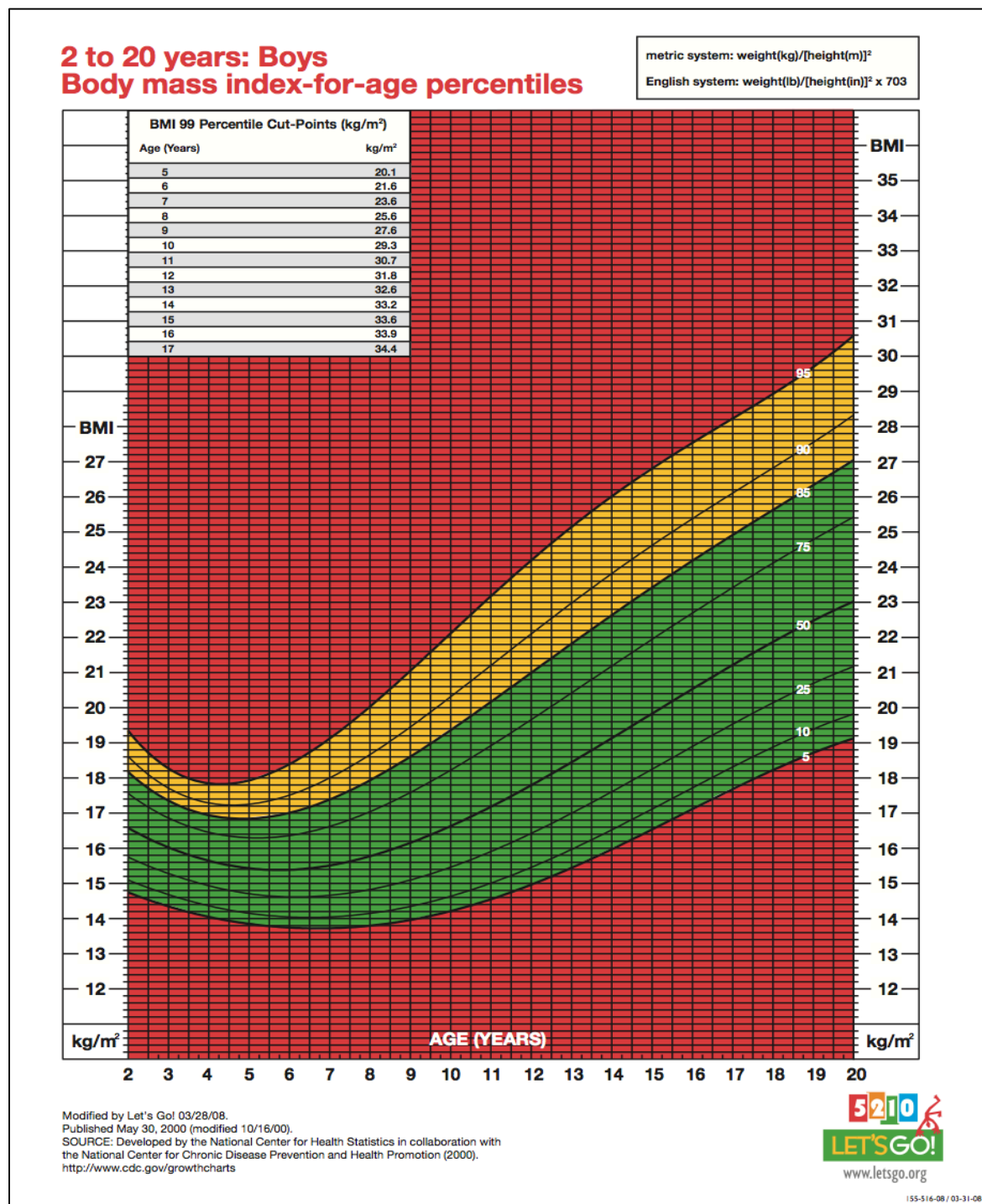
SOURCE: Developed by the National Center for Health Statistics in collaboration with the National Center for Chronic Disease Prevention and Health Promotion (2000).

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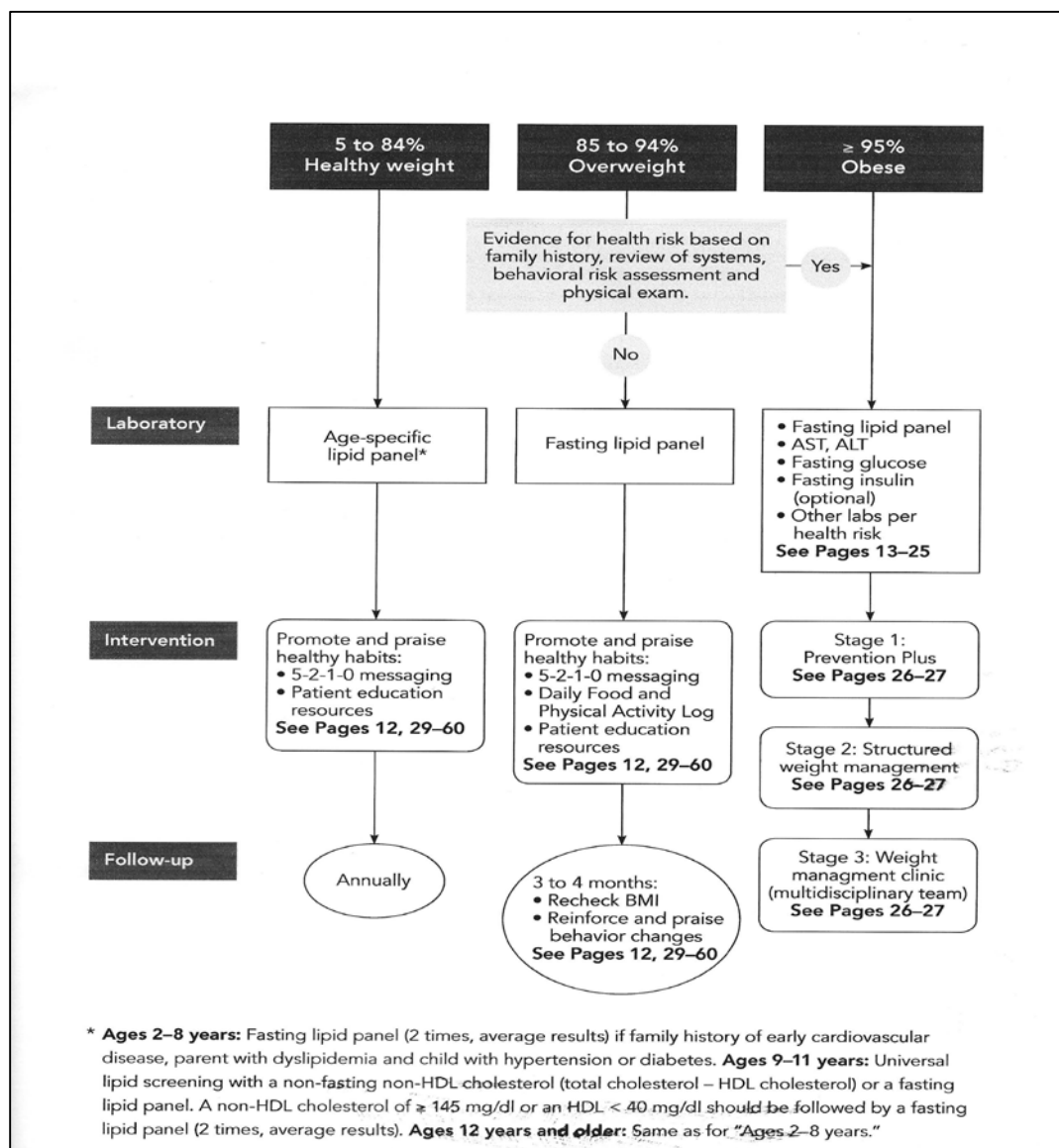
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Appendix F: Growth Chart Prompt



Appendix G: Park Nicollet Algorithm



Appendix H: Staff BMI Training

Calculating, Plotting, and Tracking BMI Percentiles for Children and Adolescents:

Four Step Method

1. Accurately measure weight and height.
2. Calculate BMI using a manual method as listed below or automatically calculated and plotted through the EMR.
3. Manually plot BMI for age and sex on the CDC BMI Growth Charts (see chart below) to determine patient's BMI percentile category:

Normal/Healthy weight- 5th percentile to <85 percentile

Overweight- $\geq 85^{\text{th}}$ percentile to less than 95th percentile

Obese- $\geq 95^{\text{th}}$ percentile

4. Document BMI percentile for child or adolescent on the super bill and on the patient's chart.

Super bill BMI prompt

BMI_____

HT_____

WT_____

Category: Overweight and or Obese

Utilization of Park Nicollet algorithms for screening, identification, assessment and treatment:
Utilization of 5210 Let's Go color-coded clinical growth chart for age and sex.

Identify- BMI

Assess- for other risk factors

Screen- Provider directed to screen for labs due to risk factors

Appendix I: Observation Checklist

Observational Checklist on Staff Procedures and Interactions with Patients

Behaviors	Yes	No	Comments
Performs accurate weight, height and blood pressures for age			
Every child was asked to take shoes off prior to measurements			
BMI was plotted on growth chart by EMR and reviewed results with patient and family			
Abnormal BMIs were reported to provider			
Reviews recommendations for any lab work, or other screenings based on abnormal BMI			
Collects and documents history of family on health conditions (obesity, diabetes, and/or heart disease)			

Appendix J: Pre and Post Exam

Pre and Post-test exam

1. Accurate height and weight measurements are done by:
 - a) Taking the parents verbal information on the child's height and weight
 - b) Asking the child to remove his or her shoes and to step on a scale that is calibrated and also has a stadiometer to measure height
 - c) Weighing the child with his shoes on
2. BMI stands for:
 - a) Body and muscle index
 - b) Body mass index
 - c) Bone mass interval
3. BMI is calculated by:
 - a) Weight in pounds divided by height in inches, squared x100
 - b) Weight is Kg divided by height in meters, squared
 - c) Bone mass interval
4. The following is correct for children who are overweight and obese; a BMI of:
 - a) >25 and >40
 - b) >85 percentile and >95 percentile
 - c) > 30 and >60
5. The CDC growth chart can be used to:
 - a) Plot the child's BMI for age and sex
 - b) Plot the child's BMI for stature
 - c) Plot the boys and girls BMI on the same sex chart
6. The American Academy of Pediatric recommends:
 - a) That BMI be done on every child annually
 - b) That BMI be done on the child on their 5th birthday
 - c) That BMI be done every month
7. The BMI percentile growth charts should be discussed with:
 - a) Patient and family member each visit
 - b) Should not be discussed with the parents of the child
 - c) Should be plotted on the growth chart by staff, and discussed with child and family member

BMI_____

Category: Overweight____ or Obese____

[illegible]

Strengths

- DNP/provider agreed to conduct change and improve standards of care through implementation of project.
- The staff and other stakeholders are on board to take part in a change process.
- Committed to adhering to recommended guidelines based on evidenced-base care.

Weaknesses

- Limited/small staff.
- Limited knowledge of standards of care for overweight and obese children.
- Not using the EMR to full potential, lacking tools and prompts to guide care.
- Limited supplies/sources to provide education to staff.

Poor and limited communication between staff and provider.

Opportunities

- Willing to change and improve standards and quality care to patients.
- Growing clinic in a highly populated community.
- Increase clinic profits by improving care of popular condition in Hispanic communities.

Threats

- Staff retention/turnover of medical assistants.
- Poor schedule or follow-up of patients.
- Limited time for education during patient encounter.
- Busy clinic, high patient flow.

Appendix M: Timeline Chart

Task Name	Start	End	Duration (days)
Pre chart audits	6/1/16	6/5/16	5
Pre test/Educational training/Post test	6/6/16	6/10/16	5
Direct observation, Data collection	6/13/16	9/1/16	-----
Post chart audits/data analysis	9/1/16	9/15/16	-----

Data Collection Sheet

[illegible]

Appendix O: Evaluation Model

Project Objective 1: By June 6, 2016, 100% of the clinical staff (medical assistant, paramedic/lead medical assistant and DNP/provider) will attend a 20-30 minute educational training sessions provided by the DNP student. The purpose of the sessions will be to improve their knowledge regarding the standard procedure to obtain height, weight, and BMI percentiles for age and gender, plot and categorize BMI on growth charts, and demonstrate the ability to perform these functions.

Evaluation Model	Evaluation Component	What to evaluate	How to get information (What method, where will you find reliable and valid information that you need)	When/how often to do this	Who is responsible
Kirkpatrick	Reaction	The staff’s interest or motivation of the given educational session	Post debriefing session	Immediately following the educational/ training session.	DNP student
	Learning	The staff’s comprehension of the educational sessions	Pre and Post test (See Appendix J). Return demonstration of plotting, calculating BMI using a skills check off list.	Prior to the start of the session, immediately after the session, and 4-6 weeks post test	DNP student
	Behavior	The staff performs proper weight, height, BMI plotting on growth chart	Direct observation, Observation checklist (See Appendix I).	Pre test, after post test, and 4-6 weeks post test	DNP student
	Results	Improved performance of providing consistent standards	Direct observation checklist, debriefing, chart audit reviews (See Appendix I).	Prior to implementation, and post implementation 4-6 weeks	DNP student

Project Objective 2: By August 31, 2016, the clinic will demonstrate improvement in the process of identifying and managing childhood overweight and obesity care as evidence by:

a. The MAs will approximately measure and document height, weight, and plot BMI on growth charts for 100% of pediatric and adolescent patients seen in the clinic.

b. The DNP provider will document any abnormal BMIs and order appropriate lab work and follow up care for at least 75% of pediatric and adolescent patients seen in the clinic.

Evaluation Model	Evaluation Component	What to evaluate	How to get information (What method, where will you find reliable and valid information that you need)	When/how often to do this	Who is responsible
Kirkpatrick	Reaction	Evaluate if staff liked taking part of the training on the abnormal ranges of BMI for age and sex as per using the growth chart for children	Educational sessions, tool kit, algorithm, direct observations, checklist and chart reviews (See Appendix G, H, I, & N)	Before and after the implementation of the project begins	DNP student
	Learning	If the staff has increased understanding of normal and abnormal BMIs (BMI >85% - <94%=overweight, BMI >95%= obesity)	Pre and Post test, tool kit algorithm and debriefing (See Appendix J, & G)	Prior to the start of the session, immediately after the session, and 4-6 weeks post test	DNP student
	Behavior	If the staff is documenting and reporting abnormal BMIs and if they are following through with plotting and categorizing the BMIs	Direct observation and chart reviews	Before and after implementation	DNP student
	Results	Consistent use of the EMR to guide identification, management, communicating to the provider recommended level of treatment as per the pediatric tool kits/algorithms	Direct observation checklist, interviews, chart audit reviews, algorithm, and data collection sheet checklist (See Appendix I, N, & O)	Before and after implementation and 4-6 weeks post implementation	DNP student

		for abnormal BMIs			
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Project Objective 3: By August 31, 2016, there will be 100% improvement in the standard of care process and behavior as the DNP will:
a.) Increase adherence to utilizing recommended evidence-based guidelines and prompts in the identification, assessment and management for children and adolescents experiencing overweight and obesity as evidence by documentation in patient records b.) Provide early preventative measures as evidence by documented abnormal BMIs on the problem list, as a diagnosis on the patient chart, and notations of timely follow ups to track progress.

Evaluation Model	Evaluation Component	What to evaluate	How to get information (What method, where will you find reliable and valid information that you need)	When/how often to do this	Who is responsible
Kirkpatrick	Reaction	Evaluate if staff understands the abnormal ranges of BMI for age and sex as per using the growth chart for children	Educational sessions, tool kit, algorithm, direct observations, and chart reviews, debriefings (See Appendix G, H, & I)	Before and after the implementation of the project begins.	DNP student
	Learning	If the staff has increased understanding of normal and abnormal BMIs	Pre and post test, tool kit algorithm (See Appendix J, & G)	Prior to the start of the session, immediately after the session, and 4-6 weeks post test	DNP student
	Behavior	If the staff is documenting and reporting abnormal BMIs and if they are following through and plotting the BMIs	Direct observation/checklist (See Appendix I) and chart reviews	Before and after implementation	DNP student
	Results	Consistent use of the EMR to	Direct observation, interviews, chart audit	Before and after	DNP student

		guide assessment, management, documentation and plotting of BMIs, and notifying provider	reviews, and tool kits (See Appendix G, & I)	implementation and 4-6 weeks post implementation	
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